

MSW RECYCLING BY COMMODITY

This section highlights the commodities that make up municipal solid waste (MSW) as defined by South Carolina. These commodities also form the basis for all of the state's recycling programs. The amounts collected are used to calculate the state's MSW recycling rate.

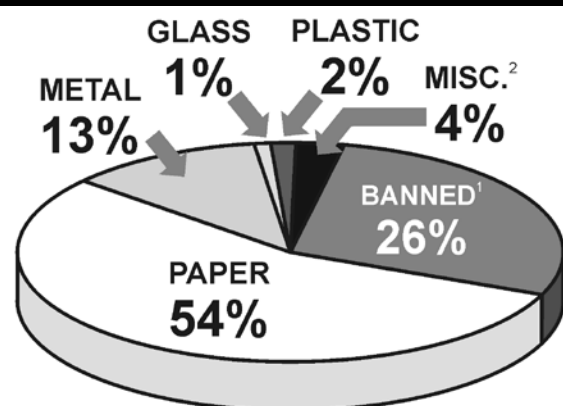
For each commodity, a definition and description are given, the recycling tonnages are provided for the past six years and an interpretation of the amount recycled in fiscal year (FY) 2006 is offered. Trend information was compiled from a variety of solid waste management publications as well as staff assessments.

In addition, a chart showing the average price received for each commodity or subgroup in FY06 is provided. Pricing information was provided by six to 11 counties, depending on the commodity. That is but a fraction of the county programs that market their material and it is for this reason that additional pricing information was obtained from "Waste News." "Waste News" is a bi-weekly news publication in North America written specifically for decision-makers in the solid waste and recycling industry. As part of its subscription service, the publication provides market prices for the Southeast. The weekly data was averaged for some comparison between the Southeast and South Carolina market prices. What has not changed are the various factors that affect market prices: quantity, quality, location and processing capabilities.

Of the six categories that make up MSW (glass, metal, paper, plastic, banned and miscellaneous), only two (glass and paper) saw an increase in tonnages from FY05.

Chart 3.1 shows a breakdown, by weight, of the MSW recycled in FY06. Chart 3.2 notes the locations of the nine materials recovery facilities (MRFs) that currently operate in South Carolina. MRFs are defined as facilities where recyclables are sorted into specific categories, baled, shredded or otherwise prepared for transportation to market for remanufacturing.

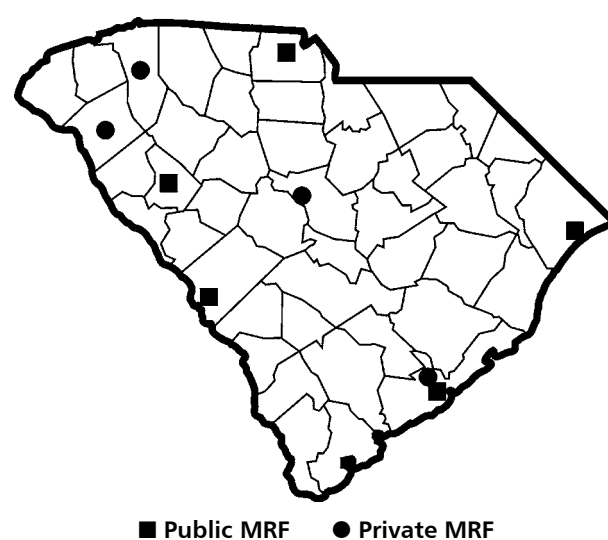
CHART 3.1: MSW Recyclables Collected by Percentage*



1. Banned items include the following: appliances; lead-acid batteries; tires; used motor oil (from do-it-yourself oil changers); and yard trimmings.
2. Miscellaneous items include: antifreeze; consumer electronics; cooking oil; fluorescent bulbs; food scraps (post-consumer only); household hazardous materials; mattresses; paint; textiles; used oil filters; wood packaging; other wood (such as furniture and cabinets); and other non-packaging products.

*COMMODITIES MEASURED BY WEIGHT

CHART 3.2: Materials Recovery Facilities (MRF)



COMMODITY: GLASS

The amount of glass collected for recycling rose from 10,406 tons in FY05 to 11,090 tons in FY06. A significant portion of the increase came from the commercial category. This includes bars, restaurants and other businesses that generate high-value recyclables. Local governments are encouraged to establish commercial collection routes to provide glass recycling.

Despite an increase in the number of counties reporting glass recycling – 31 in FY05 to 33 in FY06 – the residential glass tonnages dropped about 1,000 tons from the previous FY. And yet, almost 80 percent of the glass collected came from residential programs – both curbside and drop-off recycling centers.

In addition, the revenue earned for glass fell slightly for both clear and brown. As noted in Chart 3.5, markets for green glass continue to struggle, ranging from earning a few dollars per ton to costing counties to recycle. Counties with a large volume of green glass are able to generate limited revenue.

According to the Glass Packaging Institute, in 2005, glass made up 5.2 percent of the municipal solid

waste stream by weight, and of that, 25.3 percent of glass containers were recycled. Glass can be recycled again and again with no loss in quality or purity. Glass containers go from recycling bin to store shelf in as little as 30 days – again and again.

Glass collected in South Carolina for recycling is sent to two regional processors – Strategic Materials in Georgia and Container Recycling Group in North Carolina.

When the glass is taken to a processor, it is broken up into smaller pieces called cullet. The broken pieces are crushed, sorted, cleaned and prepared to be mixed with other raw materials in the glass-making process. The cost savings of recycling is in the use of energy. When glass is made from virgin materials, high temperatures are needed to melt and combine all the ingredients. Since cullet melts at a lower temperature, the more of it that is added to a batch of raw materials, the less energy is needed to melt it.

DEFINITION: Glass is defined as containers including bottles and jars for drinks, food, cosmetics and other products. When recycled, container glass usually is separated into colors for conversion into new containers, construction materials or fiberglass insulation. This category does not include glass from windows, plates and drinking glasses.

CHART 3.3: Glass Recycling Figures by Year

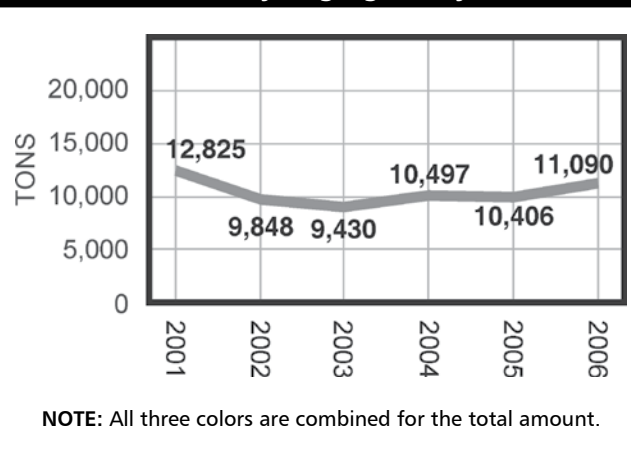
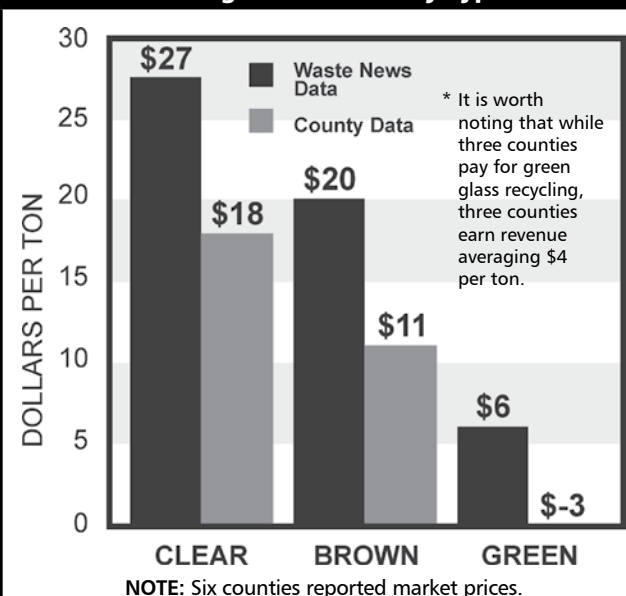


CHART 3.4: Total MSW Glass Recycled in Tons

	FY06	FY05	+/-
Brown	2,802	2,570	+232
Clear	3,291	2,877	+414
Green	2,779	2,713	+66
Mixed	2,218	2,246	-28
TOTAL	11,090	10,406	+684

CHART 3.5: Average Glass Prices by Type



COMMODITY: **METAL**

The amount of metal recycled in FY06 was 201,241 tons – a decrease of nearly 84,000 tons from the previous FY. The decrease probably can be attributed to fewer companies reporting their recycling activities as most of the decrease was found in the aluminum and ferrous materials categories of the commercial and industrial sector. By comparison, the residential metal category increased more than 2,000 tons despite the fact that one less county (44 in FY06 compared to 45 in FY05) collected metal for recycling in FY06 from the previous FY.

This is the second lowest amount of metal reported since FY01 despite substantially higher market prices for aluminum and scrap metal from the previous FY. It should be noted that commercial businesses and industry voluntarily report to the county in which they do business. If a county recycling program

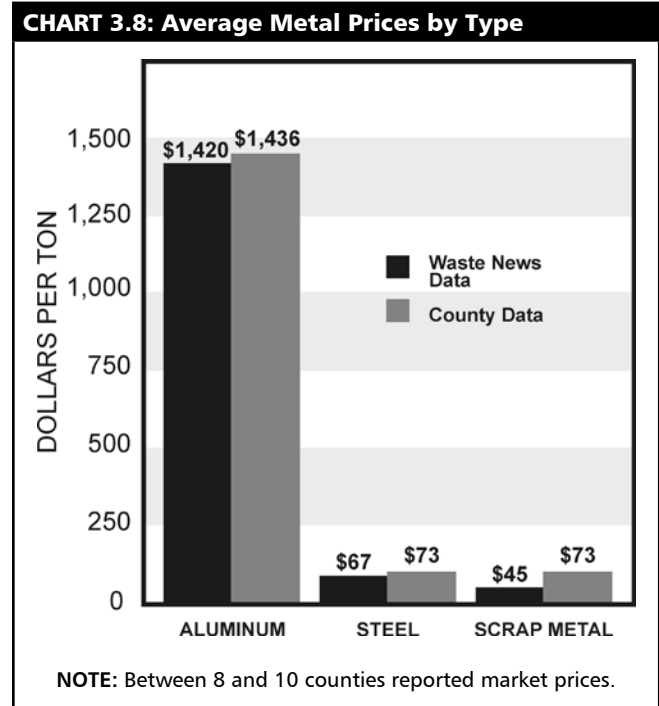
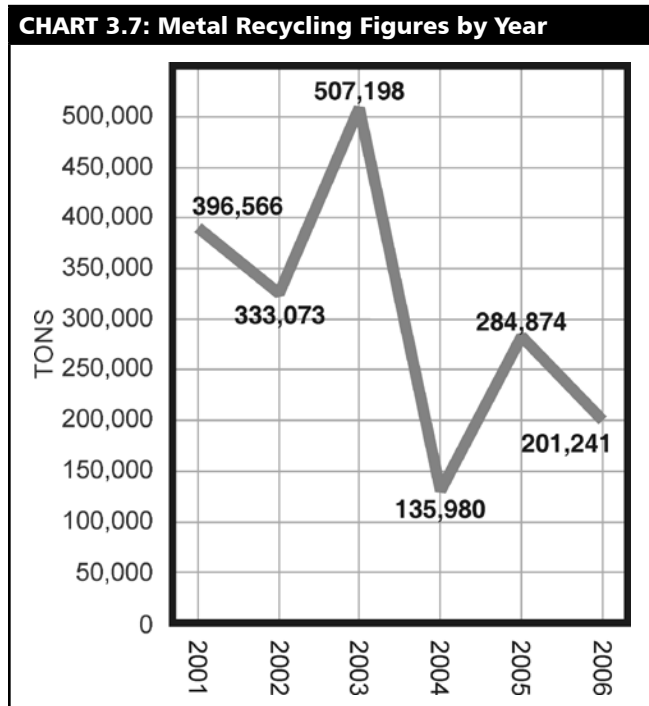
does not receive a report, it can have a direct and significant impact on the recycling numbers reported to DHEC.

The types of metals that are considered MSW and can be counted towards the recycling rate include aluminum and steel cans, scrap metal, aerosol cans as well as aluminum foil and pans. On the other hand, metal from construction and demolition activities, automobiles and industrial processing is not counted towards the measured MSW rate but are included in the state's total recycling effort.

For many years, steel has been one of the most commonly recycled materials around the world. The steel industry needs scrap to produce new steel, which ensures that all steel products contain from 25 to 100 percent recycled content. According to the Steel Recycling Institute, three-fourths of all American steel is recycled into new products.

CHART 3.6: Total MSW Metal Recycled in Tons			
	FY06	FY05	+/-
Aluminum	6,606	49,250	-42,644
Steel	4,415	3,987	+428
Non-ferrous	943	3,899	-2,956
Ferrous	77,477	130,559	-53,082
Other/Mixed Metal	111,800	97,179	+14,621
TOTAL	201,241	284,874	-83,633

DEFINITIONS: Ferrous metal is magnetic and is derived from iron or steel. Products made from ferrous metal include appliances, furniture, containers and packaging like steel drums and barrels. Non-ferrous metal is non-magnetic and includes aluminum, lead and copper. Products made from non-ferrous metal include containers, packaging, furniture, appliances, electronics and aluminum foil.



COMMODITY: **PAPER**

The amount of paper recycled increased from 397,751 tons in FY05 to a record 822,026 tons in FY06 – an increase of 107 percent. As noted in Section 2, the significant increase in paper also is credited with increasing the recycling rate for FY06 to 30.4 percent.

For the first time, staff within DHEC's Office of Solid Waste Reduction and Recycling (Office) secured additional tonnages from companies that had not previously reported to counties. Based on their population, all 46 counties were credited with the tonnages received from this effort. The tonnages came primarily from two sources: Sonoco Products Company – which worked closely with staff to identify previously unreported tonnages of recycled cardboard and office paper – and a few large grocery store chains that send their cardboard back to their distribution centers (that in some cases were out of state) and had not been previously reported.

According to the U.S. EPA's "Municipal Solid Waste Report: 2005 Facts and Figures," paper and paperboard were recovered at a rate of 50 percent, surpassing the 48 percent in 2003. This trend is reflected in South Carolina's numbers as more and more paper is being kept of the landfill.

While there are different grades of paper and some generate more revenue than others, the value of all grades increased substantially over FY05. See Chart 3.12 for FY06 specific pricing information.

DEFINITION: Paper refers to products and materials – including newspaper, magazines, office paper, corrugated containers, bags and some paperboard packaging – that can be recycled into new paper products. Cardboard was the No. 1 recycled item followed by mixed paper and newspaper.

CHART 3.10: Total MSW Paper Recycled in Tons

	FY06	FY05	+/-
Cardboard	619,650	219,654	+399,996
Magazines	2,005	5,588	-3,583
Newspaper/Inserts	68,945	63,595	+5,350
Office Paper	49,585	28,508	+21,077
Paperboard	4,264	3,726	+538
Phone Books	384	453	-69
Other/ Mixed Paper	77,193	76,227	+966
TOTAL	822,026	397,751	+424,275

CHART 3.11: Paper Recycling Figures by Year

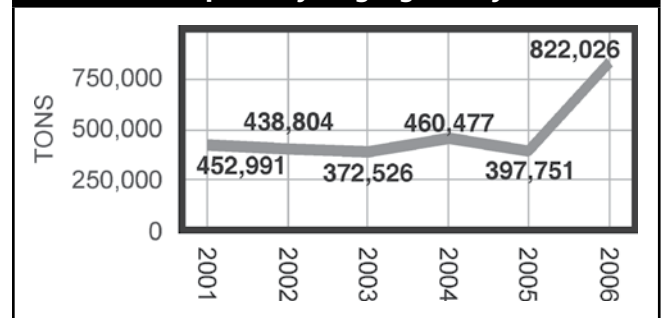


CHART 3.9: Types of Paper Recycled

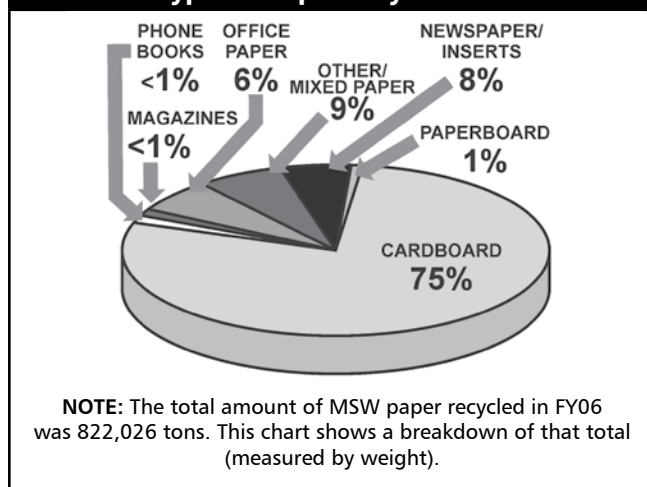
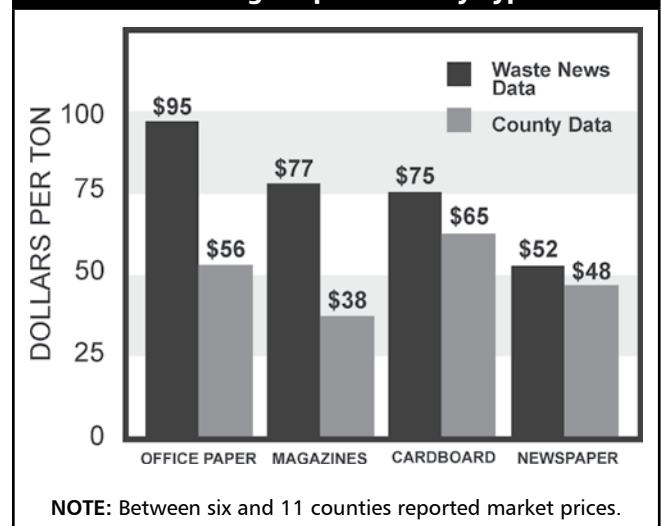


CHART 3.12: Average Paper Prices by Type










COMMODITY: **PLASTIC**

The amount of plastic collected for recycling fell slightly from 20,725 tons in FY05 to 20,379 in FY06 – a less than 2 percent decrease. There was, however, an increase in the amount of plastic collected in local residential programs (both curbside and drop-off) – even with the number of counties (40) collecting plastic remaining the same.

In the most recent data available, national recovery rates for both polyethylene terephthalate (PET) and high-density polyethylene (HDPE) posted increased recycling rates from the previous year at 23.1 percent¹ and 27.1 percent², respectively. In fact, PET and HDPE continue to comprise more than 95 percent of the plastic bottle market².

Plastic doesn't have the market value compared to other container and packaging commodities, particularly aluminum as well as clear and brown glass. The weight – or lack thereof – results in having to collect more plastic to generate marketable quantities. Also, the convenience of plastic beverage containers gives consumers the opportunity to take the product anywhere including places that may not have convenient recycling opportunities.

1. National Association for PET Container Resources "2005 Report on Post-consumer PET Container Recycling Activity"
2. The Association of Post-consumer Plastics Recyclers "2005 National Post-consumer Plastics Bottle Recycling Report"

CHART 3.13: Total MSW Plastic Recycled in Tons				
—	TYPE	FY06	FY05	+/-
	PET	2,504	2,334	+170
	HDPE	6,887	6,399	+488
—	PET / HDPE (commingled)	1,643	2,664	-1,021
	V or PVC	48	188	-140
	LDPE	1,668	1,425	+243
	PP	145	29	+116
	PS	<1	9	-9
	Other/ Mixed Plastic	7,484	7,677	-193
	TOTAL	20,379	20,725	-346

Recycled PET is used primarily in the fiber industry for carpet, clothing and other similar products. Recycled HDPE has a variety of end uses including buckets, crates, pallets, lumber, automotive parts, film, pipe as well as lawn and garden products.



DEFINITION: Plastic refers to containers and packaging made from various resins ( to ) but does not include plastic from automobiles and construction products.

CHART 3.14: Plastic Recycling Figures by Year

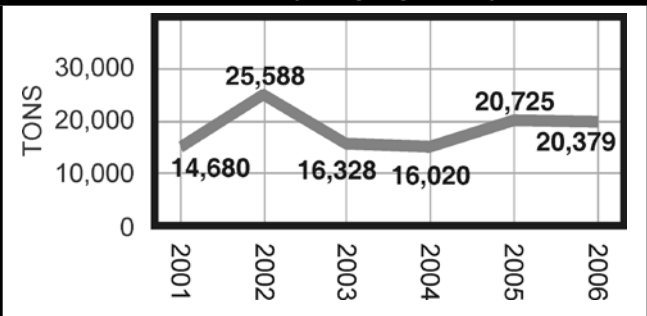
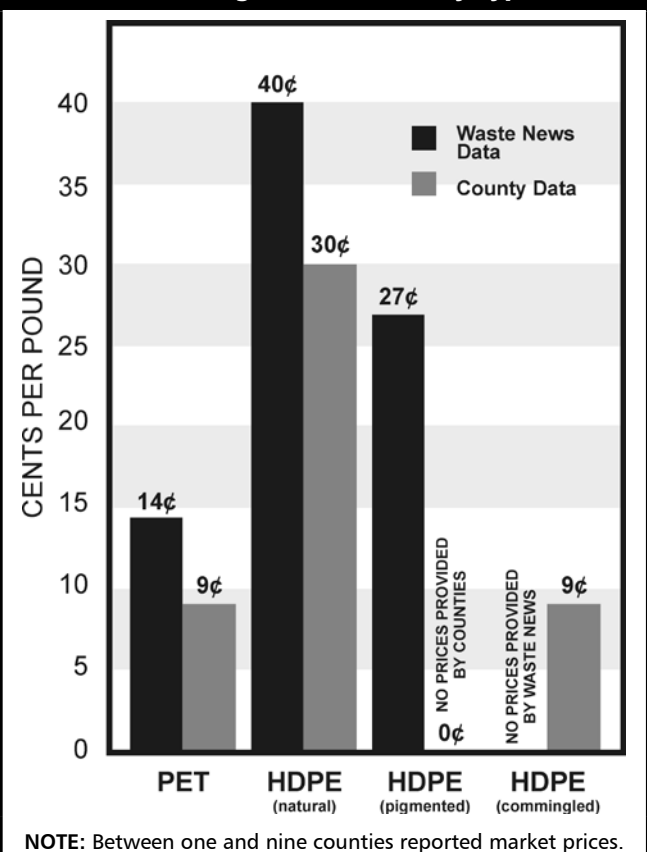


CHART 3.15: Average Plastic Prices by Type



NOTE: Between one and nine counties reported market prices.

COMMODITIES: **BANNED & MISCELLANEOUS ITEMS**

BANNED ITEMS are those items that cannot be disposed of in South Carolina's MSW landfills by law. These items include lead-acid batteries, tires, used motor oil, large appliances (also known as white goods) and yard trimmings. Again this year, used motor oil that was generated and recycled by do-it-yourselfers (DIYers) is included in the MSW recycling rate. (See page 23 for a summary of the state's used motor oil recycling program.)

South Carolina was recently honored by the Rubber Manufacturers Association as the No. 1 state for managing its waste tires. The state's top ranking is based on the percentage of tires going to end-use markets, the number of stockpiled tires and the number of tires disposed of in landfills.

While banned items usually are not collected in curbside programs, most can be taken to county drop-off recycling centers or to retailers when new products are purchased. Chart 3.16 shows a breakdown of the tonnages recycled for each commodity in FY06 as well as FY05 for comparison.

With the exception of yard trimmings, there are advanced recycling fees associated with banned items. When consumers buy motor oil, new tires, refrigerators (or other large appliances) and lead-acid batteries, they pay a small fee that is set aside in a Solid Waste Trust Fund to help pay for recycling programs across the state. These fees have helped develop and maintain curbside and drop-off collection programs as well as outreach and education efforts statewide.

CHART 3.16: Total MSW Banned Items Recycled in Tons			
COMMODITY	FY06	FY05	+/-
DIY Used Motor Oil	3,557	4,127	-570
Lead-acid Batteries	6,798	10,428	-3,630
Tires	62,765	62,736	+29
White Goods (appliances)	47,148	69,687	-22,539
Yard Trimmings	275,789	292,239	-16,450
TOTAL	396,057	439,217	-43,160

There was about a 10 percent decrease in banned items recycled from FY05 to FY06. This came mostly from the white goods category – which like scrap metal – saw a decrease in the tons reported. There may have been fewer commercial businesses and industries reporting their collected tonnages to the counties in which they conduct business. This could be a possible explanation for the decrease in the number reported to DHEC.

MISCELLANEOUS ITEMS are other materials that have been recycled. Generally, they do not fall under any other category in this annual report. These are items that counties recycle based upon local and sometimes unique markets. And while it is difficult to offer some comparison, it is worth noting that local and statewide efforts to increase recycling of certain materials have been extremely successful with more than triple-digit tonnage increases in consumer electronics, cooking oil and paint.

CHART 3.17: Total MSW Miscellaneous Items Recycled in Tons			
COMMODITY	FY06	FY05	+/-
Antifreeze	358	360	-2
Consumer Electronics	1,140	728	+412
Cooking Oil	8,362	7,804	+558
Fluorescent Tubes	450	1,172	-722
Food Scraps (post-consumer only)	24	405	-381
Household Hazardous Materials	24	929	-905
Mattresses	52	0	+52
Paint	329	198	+131
Rechargeable Batteries	220	219	+1
Textiles	1,116	6,876	-5,760
Used Oil Filters (if not included as scrap metal)	1,990	3,650	-1,660
Wood Packaging	30,231	37,482	-7,251
Other Wood	13,896	6,745	+7,151
Other Misc.	1,422	2,557	-1,135
TOTAL	59,614	69,125	-9,511

COMMODITY: **USED MOTOR OIL**

South Carolina has one of the nation's best and most comprehensive recycling programs targeting do-it-yourself oil changers (DIYers). What began in the early 1990s to conserve resources and to stop illegal dumping of used motor oil, has grown into a one-stop program that also accepts motor oil bottles, filters and oil/gasoline mixtures from DIYers as well as used motor oil from small farming operations.

The program – primarily funded by DHEC through the Used Oil Trust Fund – has grown to more than 800 collection sites across the state. In addition, the program serves as a model of how convenience and participation go hand in hand. Part of this growth and subsequent success can be attributed to retail outlets, quick lubes and auto parts stores that accept used motor oil from DIYers. For the seventh consecutive year, more than 1 million gallons of used motor oil was recycled. In calendar year 2005, DIYers recycled 1,066,336 gallons of used motor oil. Since 1990, DIYers have recycled more than 12 million gallons of used motor oil. For this report, used motor oil generated and recycled by DIYers is counted as part of the state's MSW recycling rate.

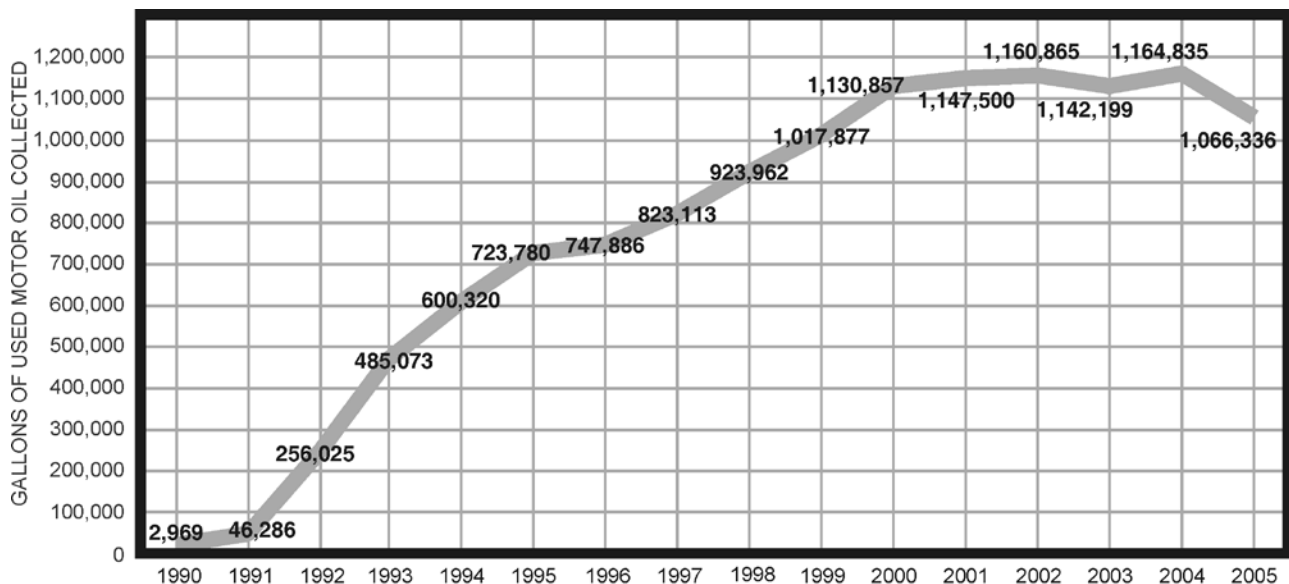
Each county has sites to collect used motor oil. Most also collect and recycle used oil filters and oil bottles from DIYers. The amount of used oil filters

and oil bottles recycled is difficult to measure directly because many counties add filters to their metal recycling and bottles to their plastic recycling totals. The Office encourages counties to establish farmer oil collection tanks as well as oil/gasoline mixture collection tanks. Farmer oil collection tanks are designed to accept the larger quantities of oil that farmers generate. Since the program began in 1998, 38 farmer oil tanks have been set up in 31 counties. Oil/gasoline mixture collection tanks are designed to accept used motor oil, gasoline and oil/gasoline mixtures. Forty-seven oil/gasoline mixture collection sites have been established in 33 counties.

Overall, there are few barriers to recycling used motor oil, used oil filters and oil bottles. The S.C. Budget and Control Board has developed a state contract to assist in the proper management of used motor oil and used oil filters. Markets are not an issue. Bottles, if properly drained, can be recycled with other plastic. In addition to the state contract, local scrap dealers and steel mills accept drained/crushed used oil filters.

While the overall program continues to be successful, the Office's goal is to have at least one farmer oil collection tank and one oil/gasoline mixture collection tank in each county as well as have each county collect used oil filters and bottles.

CHART 3.18: Used Motor Oil Collection Figures for Calendar Year 2005



NOTE: Used motor oil recycling sites are required by law to be registered with the state. Collection figures were taken from reports compiled by DHEC's Office of Solid Waste Compliance. Figures for calendar year 2006 were not available when this document was printed.

